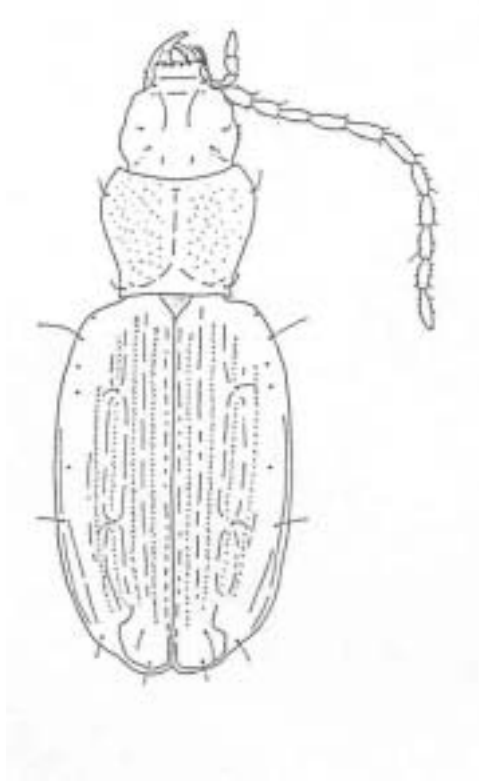


***Conservation Assessment
for
Young's Cave Ground Beetle (*Pseudanophthalmus Youngi*)***



(Barr, 1960)

USDA Forest Service, Eastern Region

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This Conservation Assessment was prepared to compile the published and unpublished information on Pseudanophthalmus youngi. It does not represent a management decision by the U.S. Forest Service.

Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

Young's cave ground beetle (Pseudanophthalmus youngi) is designated as a Regional Forester Sensitive Species on the Hoosier National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

The Young's cave ground beetle is endemic to the southcentral Indiana karst, where it has been reported from 18 caves.

NOMENCLATURE AND TAXONOMY

Classification:	Class Insecta Order Coleoptera Family Carabidae
Scientific name:	<u>Pseudanophthalmus youngi</u> Krekeler
Common name:	Young's cave ground beetle
Synonyms:	<u>Pseudanophthalmus youngi youngi</u> <u>Pseudanophthalmus donaldsoni</u>

This species was described by Krekeler (1958) as Pseudanophthalmus youngi. Barr (1960) synonymized Pseudanophthalmus donaldsoni with P. youngi, considering the species to have two subspecies: Pseudanophthalmus youngi youngi (Clifty Caves, Washington County, Indiana) and Pseudanophthalmus youngi donaldsoni (Donaldson Cave System, Lawrence County, 8 miles to the west). With additional collecting the range of Pseudanophthalmus youngi has grown and the relevance of these subspecies has diminished. Barr (personal communication, 2001) stated that in a revision of the Indiana species in preparation the subspecies will no longer be recognized as valid.

DESCRIPTION OF SPECIES

The Young's cave ground beetle is eyeless and unpigmented, which gives it a distinct red appearance in life. Identification of this species requires dissection and microscopic examination of the genitalia by a specialist familiar with the systematics of Pseudanophthalmus.

LIFE HISTORY

Little is known specifically about the life history of Pseudanophthalmus youngi. However, Barr (personal communication, 2001) reported that in most of the troglobitic carabid beetles of eastern North America egg laying is timed for the fall, because food is generally more prevalent then. Larvae appear in the winter, pupae in the late winter and

early spring, then tenerals start appearing in June and July. The beetles are almost all fully sclerotized by fall. Although this is a typical life history, the availability of food can change the cycle. The primary food source of Pseudanophthalmus is enchytraeid and tubificid worms found associated with cave mudbanks.

HABITAT

Young's cave ground beetle is a troglobite (obligate cavernicole). The beetles are found in riparian microhabitat on mudbanks, gravel or rocks, usually immediately adjacent to a cave stream.

DISTRIBUTION AND ABUNDANCE

Pseudanophthalmus youngi occurs in Crawford, Washington, Orange and Lawrence counties, Indiana. (Lewis, 1998; Barr, personal communication 2001). This distribution includes the western part of the Blue River basin extending into part of the drainage of the East Fork of the White River, where it was reported from 16 caves (Lewis, 1998).

In the Hoosier National Forest Pseudanophthalmus youngi has been found at Wesley Chapel Gulf in Elrod and Wesley Chapel Gulf caves (parts of the same cave system), Tucker Lake Spring Cave at the Springs Valley Recreation Area and from Dillon Cave. All of these localities are in Orange County, Indiana.

RANGEWIDE STATUS

Global Rank: G2 imperiled; The global rank of G2 is usually assigned to species that are known from between 6 and 20 localities. Pseudanophthalmus youngi has been reported from 16 caves (Lewis, 1998), to which the ongoing survey of caves of the Hoosier National Forest has added two sites.

Indiana State Rank: S2 imperiled; Similarly, a state rank of S2 is given to a species that is known from between 6 and 20 localities in the state. All of the known caves in which Pseudanophthalmus youngi occurs are in Indiana.

POPULATION BIOLOGY AND VIABILITY

Pseudanophthalmus youngi usually co-occurs with Pseudanophthalmus stricticollis, although the former is considerably rarer. A typical collection ratio of youngi: stricticollis is about 1:5.

POTENTIAL THREATS

Pseudanophthalmus youngi, although not common anywhere, is relatively widespread and the riparian habitat that is its typical habitat is relatively isolated from disturbances. This species is known from numerous caves, most of which appear to be environmentally stable (Lewis, 1998).

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Within the range of Pseudanophthalmus youngi the caves in which the beetle occurs are on the properties of a variety of federal, state and private holdings. In the Hoosier National Forest this species is known from Wesley Chapel Gulf Special Area in Elrod and Wesley Chapel Gulf caves, Tucker Lake Spring Cave at the Springs Valley Recreation Area, and from Dillon Cave.

Many of these locations have restricted management since they are in special areas that were designated due to their karst resources. Forest service special areas are managed for the preservation of these ecosystems (USDA Forest Service, 1991; 2000).

This species also occurs in the Bronson-Donaldson Cave System in Spring Mill State Park; Suicide Cave, Washington Co., gated and managed by the Indiana Karst Conservancy; and Marengo Cave, Crawford Co., which is gated by the commercial operators.

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

Here are no species specific management or conservation activities being conducted concerning Pseudanophthalmus youngi, however cave and karst habitat located on the Hoosier National Forest are subject to standards and guidelines for caves and karst protection and management as outlined in the Hoosier National Forest Land and Resource Management Plan (Forest Plan) (USDA Forest Service, 1991). These standards and guidelines include the following:

- *Caves are protected and managed in accordance with the Federal Cave and Karst Resources Protection Act of 1988, Forest Service Manual 2353, Memorandums of Understanding between the forest service and the National Speleological Society, the Indiana Karst Conservancy, Inc., the Forest Cave Management Implementation Plan, and individual specific cave management plans.

- *Except where modified by an existing cave management prescription, vegetation within a 150-200 foot radius of cave entrances and infeeder drainages with slopes greater than 30 percent will generally not be cut. No surface disturbing activities will be conducted on any slopes steeper than 30 percent adjacent to cave entrances. Similar protection areas will be maintained around direct drainage inputs such as sinkholes and swallow holes known to open into a cave's drainage system of any streams flowing into a known cave.

- *Allow no sediment from erosion of access roads and drilling sites to wash into caves or karst features.

*Seismic surveys requiring explosives shall not be conducted directly over known cave passages or conduits.

*All caves will be managed as significant.

(USDA Forest Service, 1991)

The forest plan includes a cave and karst management implementation plan. This management plan places an emphasis on cave resource protection and mitigation. Understanding of the caves is established through mapping, bioinventory, cataloging of resources (e.g., archaeological, paleontological, speleothems, etc.), and estimating use levels and trends. Protection zones or other mitigation measures recommended by a management prescription will be established around caves entrances, sinkholes and swallowholes. Specific criteria will include consideration for protection of entrance and cave passage microclimate, animals inhabiting the cave, physical and chemical parameters and aesthetic values associated with the cave.

RESEARCH AND MONITORING

New localities for Pseudanophthalmus youngi have been discovered as part of the biological inventory of caves on the Hoosier National Forest (Lewis, et al., 2002; and in progress).

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

REFERENCES

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